

Appl. No. 09/745,404

Response to December 24, 2003 Office action

**LISTING OF THE CLAIMS**

Claims 1-28 and 32-40 are pending. No claims are amended, withdrawn, added, or cancelled. The following listing of claims replaces all prior versions, and listings of claims in the application.

**Listing of Claims:**

1. (Original) A method comprising:  
providing an extended configuration descriptor in firmware of a USB device, the extended configuration descriptor comprising a set of non-standard class codes ; and  
responsive to receiving a host-specific device request, communicating the extended configuration descriptor to a requestor.
2. (Original) A method as recited in claim 1, wherein the set of non-standard class codes includes non-standard subclass codes.
3. (Original) A method as recited in claim 1, wherein a non-standard class code comprises a class code or a subclass code that is not defined by the USB DWG.
4. (Previously presented) A method as recited in claim 1, wherein the extended configuration descriptor further comprises a control function section indicating information corresponding to a function for the USB device.

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5. (Original) A method as recited in claim 1, wherein the extended configuration descriptor further comprises:

a header section indicating the number of control function sections for which mappings exist in the extended configuration descriptor; and,

one or more control function sections, each control function section indicating information corresponding to a single function for the USB device.

6. (Original) One or more computer-readable media containing a computer executable program that performs a method as recited in claim 1.

7. (Original) A method comprising:

querying a USB device using a host-specific device request to obtain a descriptor indicating a set of non-standard class codes;

determining one or more compatible device drivers based on the set of codes indicated by the descriptor; and

loading the one or more compatible device drivers to control the USB device.

8. (Original) A method as recited in claim 7, wherein the querying comprises:

communicating a standard USB request to the USB device; and

returning the extended configuration descriptor in response to the standard USB request, the extended configuration descriptor corresponding in the USB device to a host specific device request.

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9. (Original) A method as recited in claim 7, wherein the set of non-standard class codes includes non-standard subclass codes.

10. (Original) A method as recited in claim 7, wherein a non-standard class code comprises a class code or a subclass code that is not defined by the USB DWG.

11. (Previously presented) A method as recited in claim 7, wherein the extended configuration descriptor comprises a control function section indicating information corresponding to a function for the USB device.

12. (Original) A method as recited in claim 7, wherein the extended configuration descriptor comprises:

a header section indicating the number of control function sections for which mappings exist in the extended configuration descriptor; and,

one or more control function sections, each control function section indicating information corresponding to a single function for the USB device.

13. (Original) One or more computer-readable media containing a computer executable program that performs a method as recited in claim 7.

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14. (Original) In a USB device that responds to device requests from a host, the device requests including USB-specific device requests with corresponding USB-specified request codes and device-specific device requests with corresponding device-specified request codes, the USB-specific device requests including a GET\_DESCRIPTOR device request with a corresponding GET\_DESCRIPTOR request code, a method of implementing a host-specific device request to determine one or more device drivers to control the USB device, the method comprising:

receiving a GET\_DESCRIPTOR device request that specifies a predetermined index;

responding to the GET\_DESCRIPTOR device request by returning an extended configuration descriptor that corresponds in the USB device to the host-specific device request for a device-specific request code, the extended configuration descriptor specifying a non-standard class code that identifies a device driver to control the USB device.

15. (Previously presented) A method as recited in claim 14, wherein the extended configuration descriptor comprises a control function section indicating information corresponding to a function for the USB device.

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16. (Original) A method as recited in claim 14, wherein the extended configuration descriptor comprises device specific information, the device specific information comprising:

a header section indicating the number of control functions for which mappings exist in the extended configuration descriptor; and,

one or more control function sections, each control function section indicating information corresponding to a single function for the USB device.

17. (Original) One or more computer-readable media containing a computer executable program that performs a method as recited in claim 14.

18. (Original) A computer-readable medium containing computer-executable instructions utilized by an application program to interact with a USB control device, the computer-executable instructions comprising:

receiving a request from an application program for a set of non-standard class codes and subclass codes that correspond to the USB control device;

querying the USB control device to obtain an extended configuration descriptor, the extended configuration descriptor corresponding to a host-specific device request that identifies the set of non-standard class codes and subclass codes; and

returning the obtained extended configuration descriptor to the requesting application program.

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19. (Original) A computer-readable storage medium as recited in claim 18, further comprising:

determining, by the requesting application program, one or more default device drivers based on the returned extended configuration descriptor; and  
loading the one or more default device drivers to control the control device.

20. (Previously presented) A computer-readable storage medium as recited in claim 18, wherein the obtained extended configuration descriptor comprises a control function section indicating information corresponding to a function for the USB device.

21. (Original) A computer-readable storage medium as recited in claim 18, wherein the obtained extended configuration descriptor comprises:

a header section indicating the number of control functions for which mappings exist in the extended configuration descriptor; and,

one or more control function sections, each control function section indicating information corresponding to a single function for the USB device.

22. (Original) A computer comprising one or more computer-readable media as recited in claim 18.

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23. (Previously presented) One or more computer-readable media containing a computer-executable program for use in conjunction with a USB device that responds to device requests from the program, the device requests including USB-specific device requests with corresponding USB-specified request codes and device-specific device requests with corresponding device-specified request codes, the program comprising:

    sending a request to the USB device for an extended configuration descriptor indicating one or more control functions that correspond to the USB device;

    receiving the extended configuration descriptor from the USB device in response to the request, wherein the extended configuration descriptor corresponds in the USB device to a host-specific device request.

24. (Previously presented) One or more computer-readable media as recited in claim 23, wherein the extended configuration descriptor comprises a control function section indicating information corresponding to a function for the USB device.

25. (Original) One or more computer-readable media as recited in claim 23, wherein the extended configuration descriptor comprises:

    a header section indicating the number of control functions for which mappings exist in the extended configuration descriptor; and,

    one or more control function sections, each control function section indicating information corresponding to a single function for the USB device.

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26. (Previously presented) One or more computer-readable media as recited in claim 23, wherein the program further comprises determining one or more compatible device drivers based on the received extended configuration descriptor.

27. (Original) A computer comprising one or more computer-readable media as recited in claim 23.

28. (Original) A USB device comprising:

a processor;

a port coupled to the processor;

a memory coupled to the processor;

an extended configuration descriptor stored in the memory, the extended configuration descriptor comprising information that identifies a set of non-standard compatible IDs corresponding to the USB device; and

a control program module stored in the memory, the control program module being configured to send the extended configuration descriptor to a requestor responsive to receiving a host-specific device request at the port.

29. (Canceled).

30. (Canceled).

31. (Canceled).

32. (Previously presented) A USB device as recited in claim 28, wherein the USB device further comprises:



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a plurality of logical devices, each logical device (LD) being a sub-device of the USB device;

wherein the extended configuration descriptor further comprises a set of information corresponding to a plurality of interfaces, each LD corresponding to one or more of the interfaces; and

wherein the control program module is further configured to communicate the set of information to a requestor responsive to receiving a single request at the port.

33. (Original) A USB device as recited in claim 28, wherein the set of non- standard compatible IDs are not supported by the DWG.

34. (Presently presented) A USB device as recited in claim 28, wherein the extended configuration descriptor further comprises a control function section indicating information corresponding to a function for the USB device.

35. (Original) A USB device recited in claim 28, wherein the extended configuration descriptor further comprises:

a header section indicating the number of control functions for which mappings exist in the extended configuration descriptor; and,

one or more control function sections, each control function section indicating information corresponding to a single function for the USB device.

36. (Original) A computer-readable medium having stored thereon a data structure, comprising:

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a first data field comprising data indicating a count indicating the number of USB control functions for which mappings exist in a descriptor; and

one or more second data fields, the number of second data fields based on the count, each second data field comprising data corresponding to a single function for a USB device.

37. (Original) A computer-readable medium as recited in claim 36, wherein the first data field further comprises:

a total descriptor length indication; and  
a descriptor version indication.

38. (Original) A computer-readable medium as recited in claim 36, wherein each second data field further comprises a class code to override a standard USB DWG standard class code.

39. (Original) A computer-readable medium as recited in claim 38, wherein the class code is selected from a group of identifications comprising a compatible class code and a sub-compatible class code.

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40. (Original) A computer-readable medium as recited in claim 36, wherein each second data field further comprises:

- a control function length indication;
- a total number of interfaces indication, the total number of interfaces being grouped together to generate a control function; and
- an interface number.